United States Government Architecture, III.

Irving K. Pond, Des. Lorado Taft, Sculpt.

THE INLAND ARCHITECT AND NEWS RECORD

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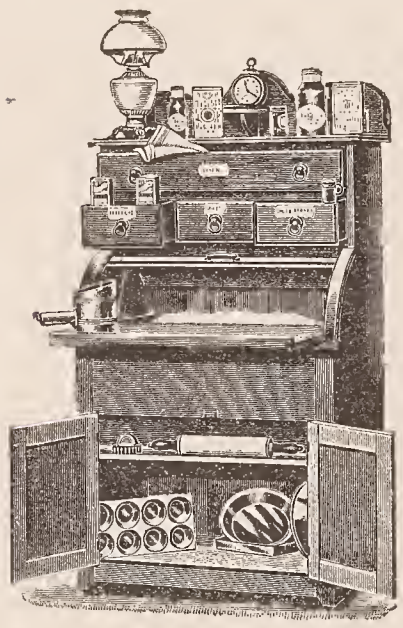

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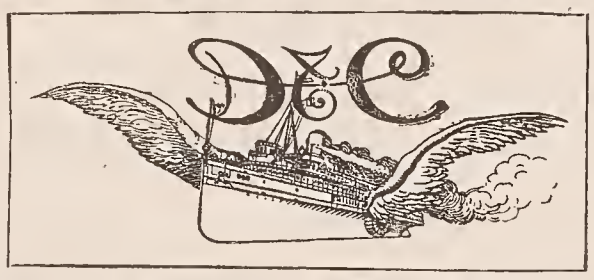

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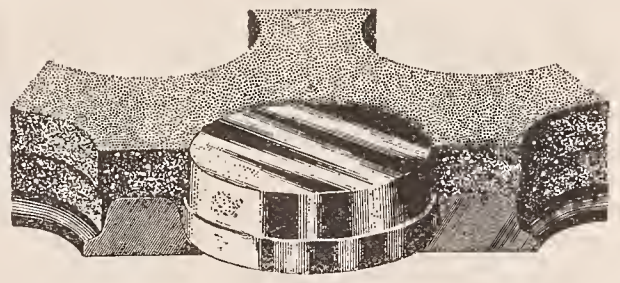

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THE INLAND ARCHITECT AND NEWS RECORD

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Need for an Art Commission in Chicago.

As an extension of the act passed by the Legislature of the State of Massachusetts in 1890 creating an Art Commission, on April 15 the House passed a bill providing for a board of art commissioners for the city of Boston. The bill provides for the appointment by the mayor of five commissioners, who must be chosen from lists supplied respectively by the trustees of the Public Library, the trustees of the Museum of Fine Arts, the trustees of the Institute of Technology, the Boston Art Club and the Boston Chapter of the American Institute of Architects. There is every reason why such a commission should be placed in authority over art matters in Chicago, where the struggle of the few who know against the mass who think they know is continuous and in which the latter is triumphant. Chicago's one artistic triumph, the World's Fair creation, was only attained by a "commission" of artists, but in all else her art has been, and is, spasmodic. It places a St. Gaudens Lincoln in one place and a Columbus statue in another, and in this manner the hit-and-miss principle will govern until a strong commission is appointed, which will not only control but stimulate all things artistic.

Death of Augustus Laval, Architect.

Augustus Laval, of late years one of the best known architects on the Pacific Coast, died at Alameda, California, on March 27. The deceased was born in England in 1834, and about 1860 went to Ottawa, Canada, where he designed and constructed the Government buildings. Afterward his designs were accepted for the New York Capitol at Albany. His career at Ottawa and Albany gave him a national reputation, which was subsequently added to in his design for the City Hall at San Francisco and his superintendence of that building under the altered plans. His work always took the form of the English school in which he was educated, and while none of his greatest conceptions were carried out entirely as designed, he showed designing talent of a superior character, which gave him rank among the last generation of architects.

Supreme Court Decision on Architects' Fees.

An important decision has recently been rendered by the Supreme Court of New York in regard to an architect's compensation for services. In the case at Poughkeepsie of Beardsley *vs.* Beyer, an agreement having been made that a fee of five per cent should be paid for the work done and three per cent if for any cause the work did not proceed, the owner refused payment because the lowest estimates were twice the sum the owner wished to expend. The defendant based his defense upon the ground that he had charged the architect that in no event was the building to cost more than seven or eight thousand dollars. The court found that "the architect is not a builder," and that "the work done by him is to be made out with extreme care so as to prevent disputes between the builders and the owner"; that the architect "did not agree to lose his labor if the estimates of others were too high," and that "the structures were exactly what was wanted by the owner, but could not be built for eight thousand dollars." The plaintiff was therefore awarded three per cent on $14,616, the amount of the lowest bid.

THE GALILEE PORCH OF TRINITY CHURCH, BOSTON.

BY C. H. BLACKALL, F.A.I.A.

A VERY notable piece of architecture has just been completed after having been in progress for several years, but carried on so quietly and with so little apparent public notice that many people who are interested in Boston architecture have hardly been aware that it was in progress. This is the so-called Galilee Porch which has been added to the west front of Trinity Church in Copley Square.

Trinity Church can fairly be said to mark an epoch, a beginning of a new dawn for American architecture. When the Trinity

CARVING FROM THE GALILEE PORCH, TRINITY CHURCH.

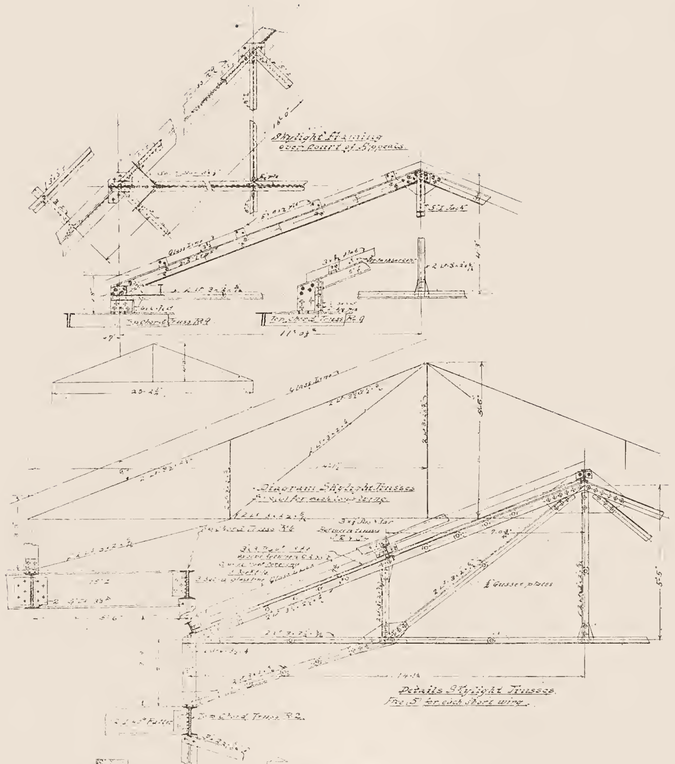
corporation decided to move from its downtown site to the Back Bay, a little less than thirty years ago, a competition was instituted which brought out work from some of the foremost architects of the country. As a result of this competition, Mr. H. H. Richardson, then almost unknown to fame, was chosen as the architect. His competitive design was not materially different from what was ultimately built, including a dominant feature of a square tower rising high above the mass of the church. The plot of land available was too restricted to carry out what was understood to be his special ideas in regard to proportions of plan. The nave has always been criticised as being too short for the bulk of the building, and the shortness has been rather emphasized by the treatment of the western front, which included two square towers, capped by tall pyramidal roofs and connected by an open arcade. Mr. Richardson prepared a drawing for a porch to be added to the existing structure, and that drawing has served as a basis for subsequent work, but no definite attempt was made during his lifetime to carry out the scheme. It was reserved for his successors, Messrs. Shepley, Rutan & Coolidge, to complete the work, necessarily with certain modifications.

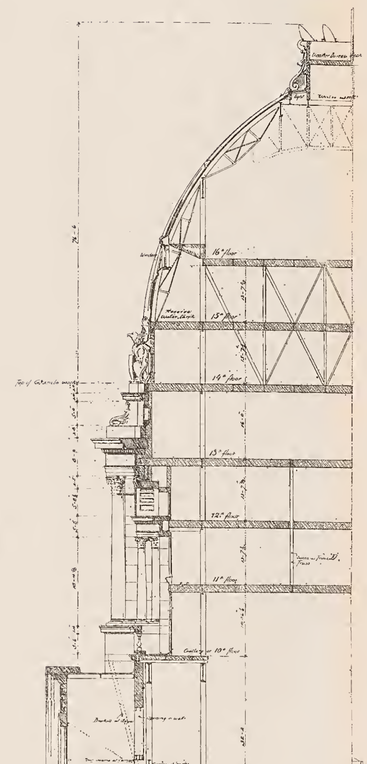
The pyramidal roofs of the square towers of the west front never seemed quite right, and were at different times very severely criticised. A few years ago these were entirely removed, leaving the cornice line of the front unbroken. It was felt that this was in some respects an improvement, notwithstanding the unfinished appearance it gave. It remained in this condition for some time until the completion of these towers and the providing of suitable spires was incorporated in the general changes incidental to the construction of the west porch.

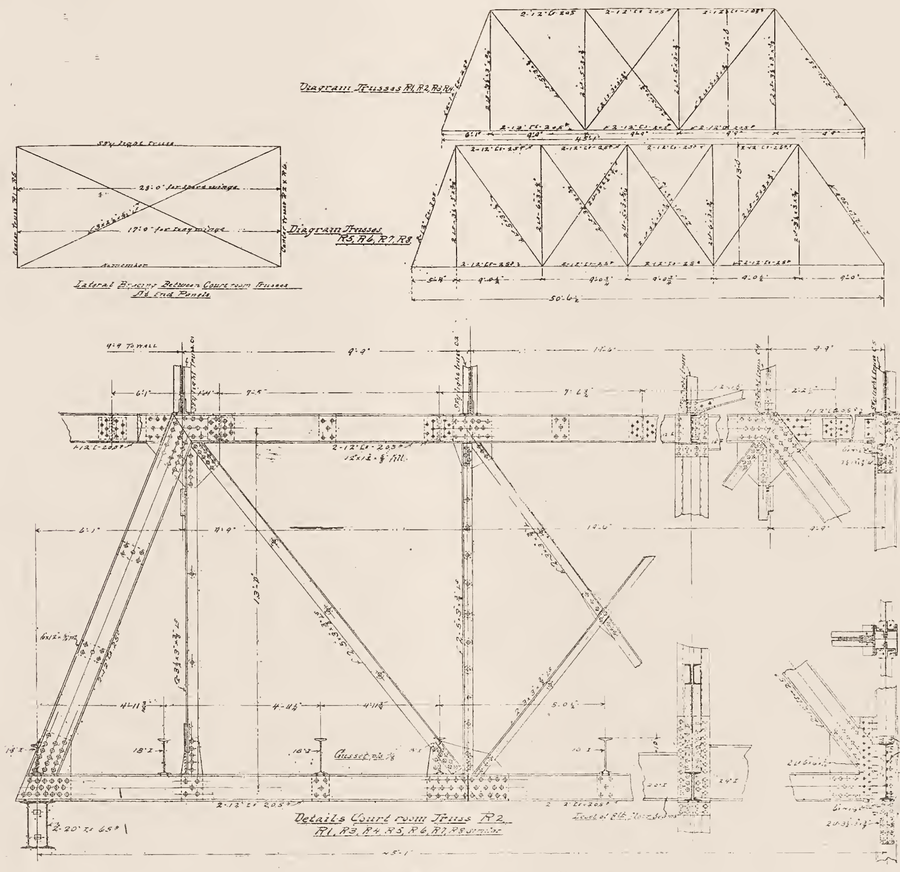
The work of adding the porch has been so long in progress, and of such a gradual growth, that it is only by looking back on the photographs of the work as it existed originally we can appreciate the baldness and unsatisfactory appearance of the front as Mr. Richardson was obliged to leave it. The arbitrary dropping of the sill course of the central arcade each side of the central towers had absolutely no meaning in the original church. The doorways lacked character, were insufficient in decoration, and there was no good reason why they should be connected by a species of blind colonnade. When we consider, however, the finished design and remember that Mr. Richardson had something of this sort in mind from the beginning, it is easy to see the reason for just what he did. The columns of the central arcade are then lengthened to a definite purpose, and the necessity for emphasizing the entrance disappears when the portals are inside of the porch, while the blind colonnade connecting the entrances is quite appropriate for the interior wall treatment of the porch.

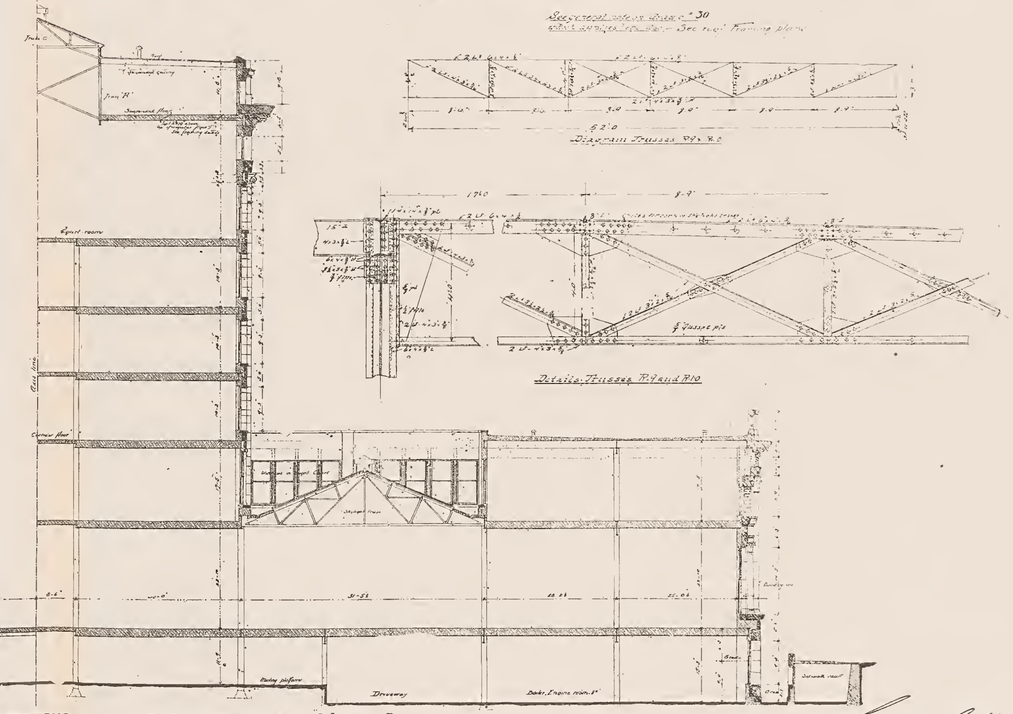
It is not too much to say that this Galilee Porch constitutes one of the most remarkable additions to our national architecture of the present generation. It is an example of what can be accomplished by making haste deliberately. The work was studied from the beginning. The church authorities, the architects and the sculptors seem to have been thoroughly in accord on the decorations; and the details, the character of the carving, show a degree of coherence and uniformity of feeling which is extremely gratifying from an artistic standpoint. That we are able, in this country, to afford the time and the money, and, after these two prime essentials are supplied, that we have the perception and the skill requisite for a production of this sort, shows that while we may have a great deal more to learn, we have made a great advance since the time the church itself was started. This is made particularly manifest by a comparison of the details. Mr. Richardson, with all his genius, had to work with the instruments he found at hand, and in the light of later successes it was pretty poor material; indeed, it is doubted if Mr. Richardson himself could have got sufficiently ahead of his generation to have done as good work then as has now been created on the porch. A comparison of the details shows that the greater portion of the older work, though Romanesque in mass, and in disposition of windows and wall surfaces, was essentially what we then called Gothic in character; the portal was not Romanesque, the treatment of it was simply several degrees better than the so-called Gothic work

CARVING FROM THE GALILEE PORCH, TRINITY CHURCH.









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From Dearborn St. looking West on axis lines of ... - SECTIONS - From Adams St. looking South, on line A B sheet no 7

Architect, U.S. Gen'l Bldg. at Chicago

Scale 1/8" = 1'-0" 1897. Drawing No. 21

GRANITE-WORK · INCH SCALE DETAILS
· THE DOME ·

SECTION C-D on Dome plan, sheet no. 12 through Square base of Dome.

SECTION E-F on Dome plans sheet no. 12 through Dome proper

ELEVATION of one half bay of Dome

Corner buttresses of Dome shown in correct Elevation

Corner buttresses of Dome shown in correct Elevation

UNITED-STATES POST-OFFICE, COURT-HOUSE ETC.,
CHICAGO, ILL.,
Drawing No. 19

GRANITE-WORK · 3/8 INCH SCALE DETAILS
THE FACADES

ELEVATION

SECTION

Elevation inside of Balcony

Continued from Sheet No. 17.

UNITED-STATES POST-OFFICE, COURT-HOUSE ETC.,
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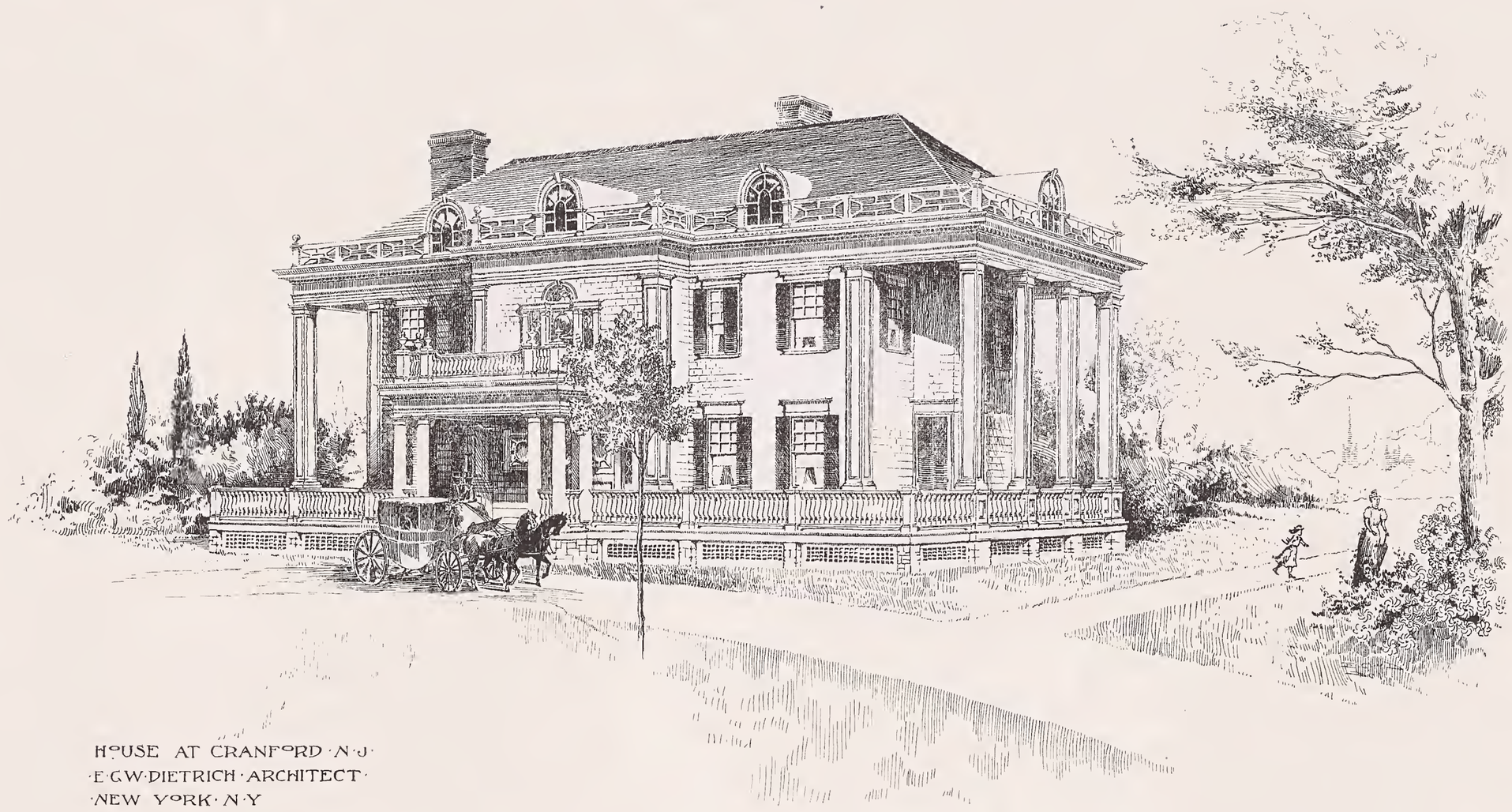
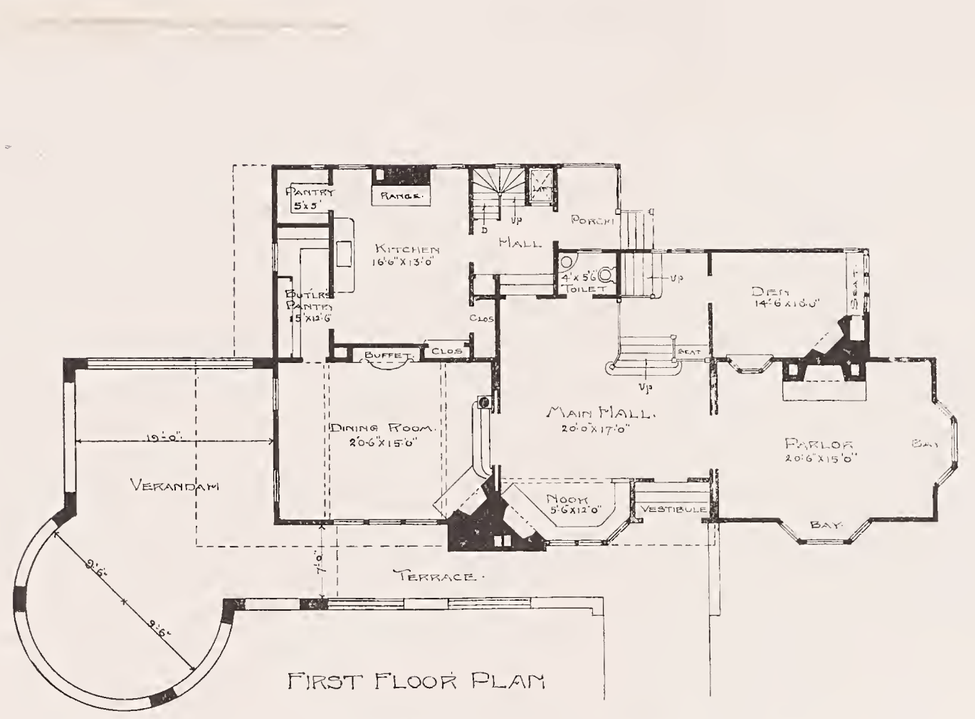
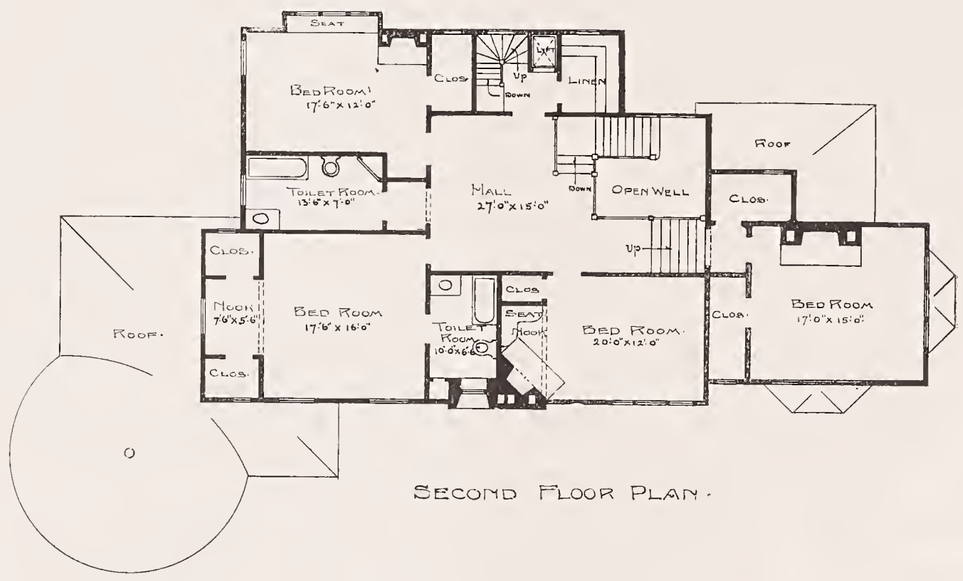


HOUSE AT CRANFORD N.J.
E.G.W.DIETRICH ARCHITECT
NEW YORK N.Y.



FIRST FLOOR PLAN



SECOND FLOOR PLAN.

MOUSE for CLAYTON E. BAILEY, ESQ.

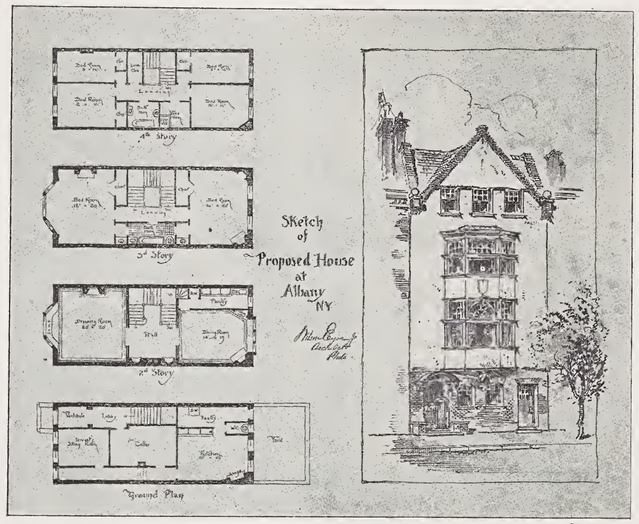
Sketch of House for Clayton E. Bailey
JAMESTOWN N.Y. {E.G.W.DIETRICH ARCHITECT 16 BROADWAY NEW YORK}

BUFFALO SAVINGS BANK (ACCEPTED DESIGN).

Green & Wicks, Architects.

SCHOOLHOUSE.

Boring & Tilton, Architects.



HOUSE AT ALBANY, NEW YORK.

Wilson Eyre, Architect.

CHURCH OF OUR SAVIOUR, MIDDLEBORO, MASSACHUSETTS.

Cram, Wentworth & Goodhue, Architects.

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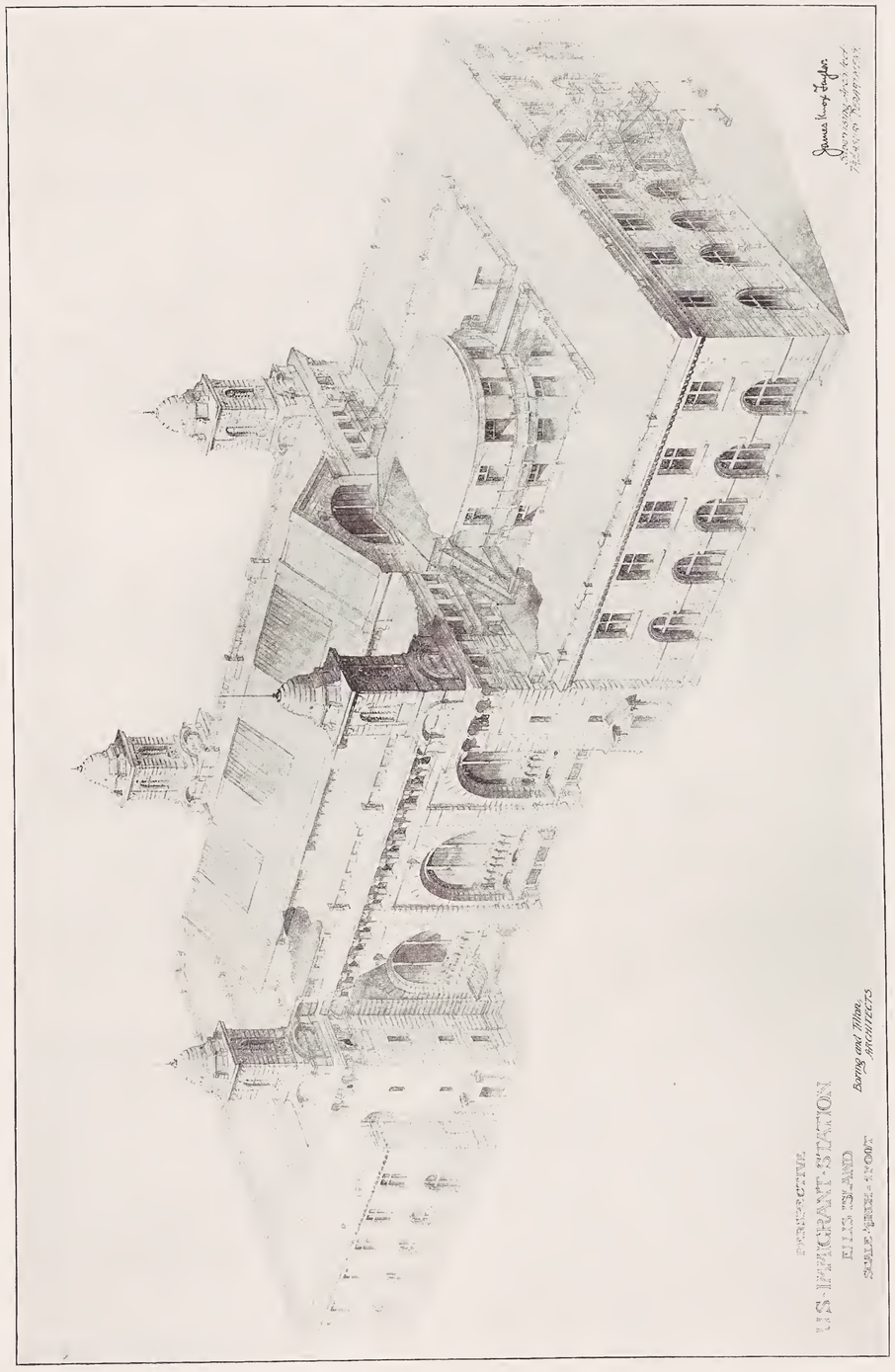

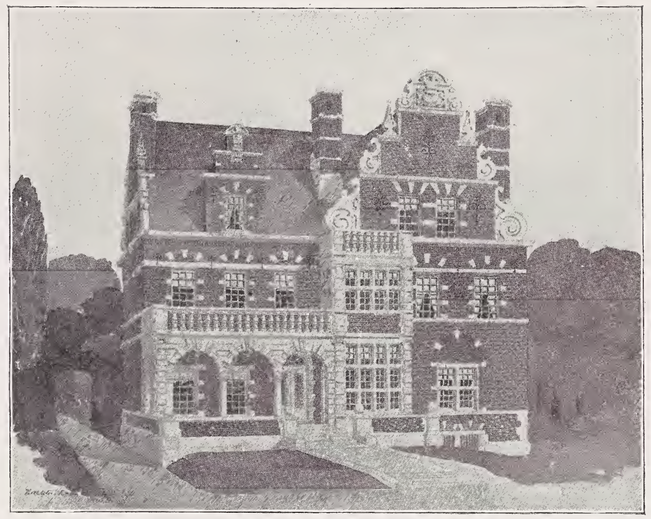

RESIDENCE.

Nettleton, Kahn & Trowbridge, Architects.

RAWITSER BUILDING, NEW YORK.

Brunner & Tryon, Architects.

COLLEGE OF THE CITY OF NEW YORK (ACCEPTED DESIGN).

George B. Post, Architect.

HOUSE FOR REV. GEORGE W. DOUGLASS, D.D.

R. Clipston Sturgis, Architect.

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TRINITY CHURCH BEFORE ALTERATIONS.

TRINITY CHURCH AS ALTERED BY SHEPLEY, RUTAN & COOLIDGE.

which architects felt obliged to do in those times. Not even Mr. Richardson's great personality could outride the limitations of that time, and so, while the conception of Trinity Church is Romanesque, and splendidly monumental, the details of the earlier portion, considered purely as detail, were far from satisfactory. They fit in place, they answer the decorative purpose of something to give relief and sparkle to the architecture, but they do not for a moment come up to the high sustained character of the new work on the west front.

The true Bostonian will feel a pride in comparing this porch with similar work abroad. The two examples which come nearest to this type of work are the north porch of Chartres and the west front of the Church of St. Gilles. The severe character of the decorative sculpture, the restrained abundance, if we may be

TRINITY CHURCH AS LEFT BY H. H. RICHARDSON.

permitted so contradictory an expression, which seems to have kept a watchful eye over the wealth of bas-reliefs, the ecclesiastical spirit which is manifested in every detail of the carving, awaken an echo from the Chartres porch. On the other hand, the disposition of mass, the treatment of moldings, and the superb management of the steps which go entirely around the porch, as well as the admirable arrangement of the vaulted ceiling inside, are suggestive, to an extent, of the southern French church. But the Galilee porch is in no sense inspired from either of them; it is a distinct creation which stands by itself, and which bears the mark of the highest kind of individuality and originality, without, however, departing from the traditional treatment which connects it to the great works of the past.

Considered in detail, the change in the towers consists in the addition to each of an attic story leading up to a dormered spire. The dormers and the spires are of brown sandstone to match the finish about the windows in the older work. The porch extends across the entire front of the nave, with three arched and gabled entrances, the whole construction springing from groups of columns of varying heights. On each side of each archway are large figures representing the prophets, the evangelists, and the early fathers of the church, ten large figures in all. Between the figures on each side of the central arch are groups of smaller statues, representing on one side the Virgin Mary, Saint Elizabeth and Saint Anne, and, on the other side, Mary, Martha and Mary Magdalen. Corresponding figures on the north, or Huntington avenue side of the porch, represent Elijah, Solomon, David, Saul and Daniel, while on the opposite side of the porch are figures of Wesley, Robinson, Wycliffe, Hooker and Tyler.

Immediately above the capitals at the line of the springing of the arches is a frieze of figures, the lines of which are carried around all sides of the porch. Each portion of this frieze represents an incident in the life of the person represented by the statue over it, and the whole forms an epitome of the tale of the Bible and of the coming of the gospel through Christ's nativity. The bas-relief which is reproduced herewith is the one on the right of the central entrance, representing the Entry of Christ into Jerusalem. The smaller one reproduced is the small group on the left of the left entrance. It is beneath the figure of Isaiah, and is inspired by the text representing one of the visions of the great prophet, "I saw also the Lord sitting upon a throne, high and lifted up. . . . Above it stood the seraphim: each one had six wings; with twain he covered his face, and with twain he covered his feet, and with twain he did fly."

The carving in this porch was executed by John Evans & Co., the sculpture being in part by Mr. Hugh Cairns, and in part by Mr. Domingo Mora. The latter carved both of the reliefs which are here shown. The individual figures were carved by Mr. Cairns.

The porch as a whole is raised upon a flight of five steps, carried entirely around each side without a break. The roof is of stone, also the interior vaulting, which consists of simple groined work. Very little was done to the body of the church except as was necessary to connect to the new work.

Now it is very easy to map out a programme incorporating the wealth of symbolism and the decorative possibilities which are implied in the porch of a metropolitan church, but to carry the whole out successfully in accordance with the spirit of the existing work, and yet with the fine feeling for detail which is essential to monumental effort, and to combine the sculptures and the architecture in such a way that they are perfectly in harmony, that they do not present the slightest appearance of a collection of casts, but that each fits as an integral portion into the whole scheme, to so adjust the details and the proportions that notwithstanding the quantity of work one thinks first and almost only of the character and general effect; all this is easy to plan in theory, but when it is carried out as successfully as it has been in this case, it certainly is deserving of recognition as an art production of the highest quality. A comparison of the three photographs will show how immensely the mass of the church has been benefited by the additions. No photograph can begin to do justice to the effect of the porch itself, for the elements of color, and the sense of scale, are qualities which are not transcribed by the sun. There have been during the past two years buildings which were much more expensive than this, on which the amount of work was greatly beyond what was expended herein, and there have been opportunities for a greater richness in display of choice material, but in no one piece of work are the dominant architectural qualities so brought out and so carefully balanced as in this Galilee Porch of Trinity Church.

FIREPROOF CONSTRUCTION OF DOMESTIC BUILDINGS.*

BY THOMAS POTTER.

(*Continued.*)

SIR WILLIAM FAIRBAIRN in his book, "The Application of Cast and Wrought Iron Work to Buildings," says the first instance of the successful application of cast-iron beams for the fireproof floors of a building, was for a cotton mill erected in 1801 (Fig. 1); the ironwork was designed by Messrs. Boulton & Watt, the cast-iron columns being entirely unprotected.

Up to 1844, numerous patents had been taken out for fireproof floors, but none came to stay until Doctor Fox introduced what was afterward known as Fox & Barrett's floor (Barrett being the business partner), and this was in use until quite recent years. Doctor Fox had, no doubt, as medical officer of a large lunatic asylum, become aware of the frightful consequences that might result in case of a fire breaking out in a building where a large number of insane patients were confined. Fox & Barrett's floor was very popular in London and elsewhere for many years.

Fig. 2 is Fox & Barrett's floor; A A, small cast-iron joists or girders; B, strips of wood, 1½-inch square, resting on the bottom flanges of joists and spaced half an inch apart; C, a coat of rough plastering mortar partially squeezed through between the wood strips; D, pugging; E, cement mortar; F, mortar made of two parts of sand and one of hydraulic lime, troweled off to form a walking surface.

Mr. Wilkinson, of Newcastle, patented several varieties of floors in 1854 and later dates; one was formed with brick arches and concrete over; another was a flat arch section of Portland cement concrete, the latter possibly the forerunner of concrete arches of considerable span.

* Paper read before the Society of Arts, January 26, 1898.

Bunnett's floor, introduced in 1858, was at that time of novel construction, namely, hollow interlocking burnt clay blocks or bricks joggling or keying each other at the joints. Fig. 3 is a

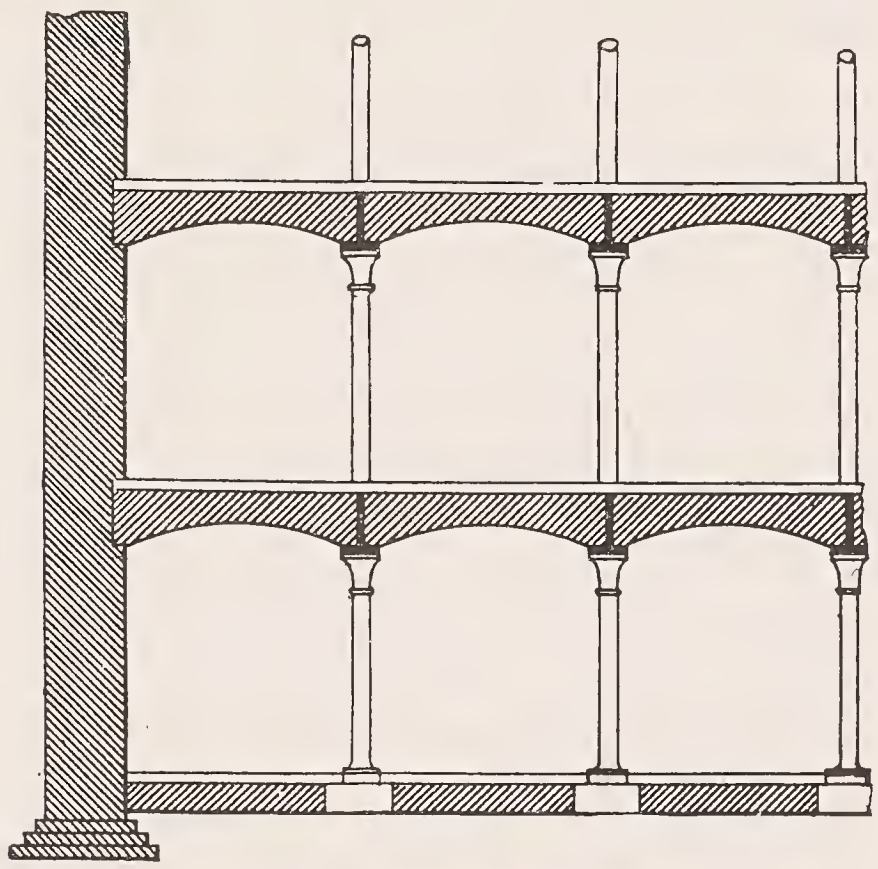


FIG. 1.—FIREPROOF FLOOR, 1801.

section of Bunnett's floor. This principle has been practiced in a variety of ways in America, but does not as yet find much favor in this country. The under side of the blocks have a dovetail groove to afford a key for the plaster, as shown, an idea which has since then been claimed as part of numerous floor patents. The floors of the Grosvenor Hotel at Pimlico are Bunnett's.

Dennett's floor, introduced in 1857, is another that has been used to a very great extent. Originally it was made with plaster of Paris as the cementitious ingredient, and consisted of segmental arches up to seventeen feet span, and cast-iron beams. Subsequently Dennett introduced various improvements. All the floors of St. Thomas' Hospital are Dennett's.

Matthew Allen, a builder of Finsbury, brought out fireproof floors in 1862, consisting of bars of iron 3 inches by ⅜ inch, laid edgewise across the building from front to back, and 2 feet apart; through these ½-inch iron rods, also 2 feet apart, were passed and secured to the bars at the ends. A temporary scaffold was fixed beneath and cement concrete was thrown in to a thickness of

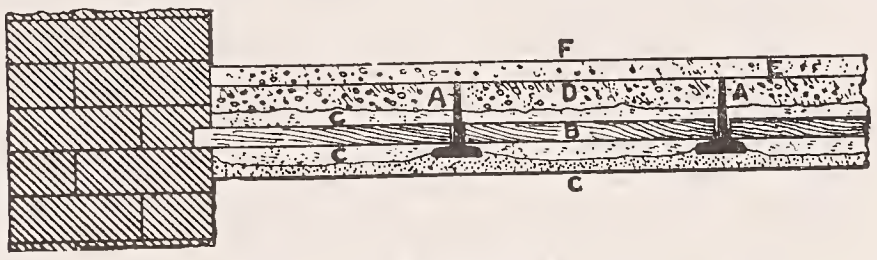


FIG. 2.—FOX & BARRETT'S FLOOR.

4 inches. The floors of the Waterlow model dwellings in Finsbury are executed in this way.

Mr. Hornblower, an architect of Liverpool, in 1873 recognized the danger of exposing iron beams to fire, and devised an ingenious arrangement of incasing them entirely with burnt clay or terra cotta, as shown in Fig. 4; A A are rolled iron girders; B, potter ware tubes; E, fine concrete at top. Hornblower's floor was used for the Liverpool Corn Exchange and many other buildings. Previous to this Hornblower had employed clay tubes, or pipes, resting on the bottom flanges of the joists, covering the latter on the under side with an inch in thickness or more of concrete, a mistake which was soon rectified by others, as shown in Swarbrick's fire-clay lintel floors (Fig. 5); A, rolled iron joist; B, earthenware lintels; E, projection to protect bottom flange of joists; D, lip to give the slab strength; H, wood joist and floor. In Hornblower's tubes, Swarbrick's slotted lintels, and Bunnett's

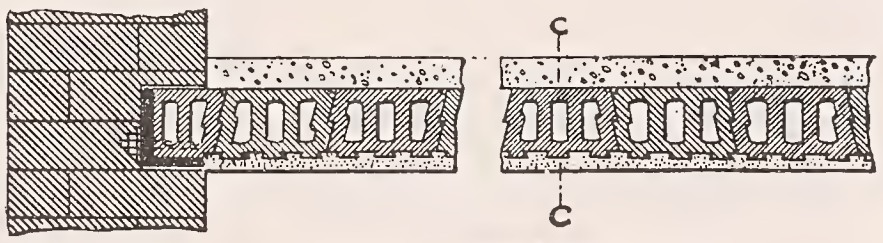


FIG. 3.—SECTION OF BUNNETT'S FLOOR.

dovetail grooves we can trace the origin of tubular lintels for fire-resisting floors as used at the present time.

But during the last twenty years many varieties of fireproof floor have been introduced, over two hundred patents having been applied for in this country alone, but the comparatively few that have been used to any extent are divisible into not more than four types. I am not going to suggest that patent floors shown here are superior to others; they are simply shown as illustrations of floors in the early history of fireproof construction, and of types of others in use now, which may be better or worse for all I know than the one hundred and ninety others not shown.

It was suggested at one time that solid wood floors would resist combustion and possess many advantages over steel and concrete. The principle proposed was to form them with deals or battens edgewise and fixed close together. This system has been practiced in America; but in a paper read lately by Mr. W. B. Mundie, an architect of Chicago, the author said that this principle of slow-burning floors was not justified by experience, for when

FIG. 4.—HORNBLOWER'S FLOOR.

once a building got well alight they made a terribly intense fire. Oak is always assumed to be fire-resisting to a high degree, but Mr. E. C. Shankland lately stated that 80,000 feet—superficial feet, probably—of oak timber was piled in a new building for the Chicago Athletic Club, and while the building was in progress a fire took place and the whole of the oak was destroyed.* Silicate cotton and asbestos have both been suggested for packing between and around all hidden timbers, but the dangerous factor wood is still in existence, only waiting for a loophole to prove how difficult it is to make a building fire-resisting, but there can be no doubt that both silicate cotton and asbestos afford very great protection.

But, with all their disadvantages, I believe it is pretty well agreed that steel beams and joists and Portland cement concrete,

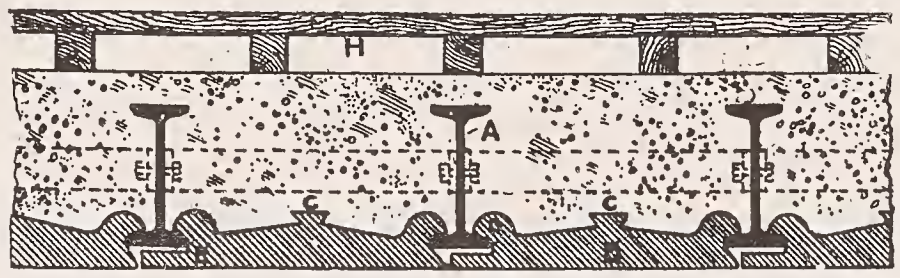
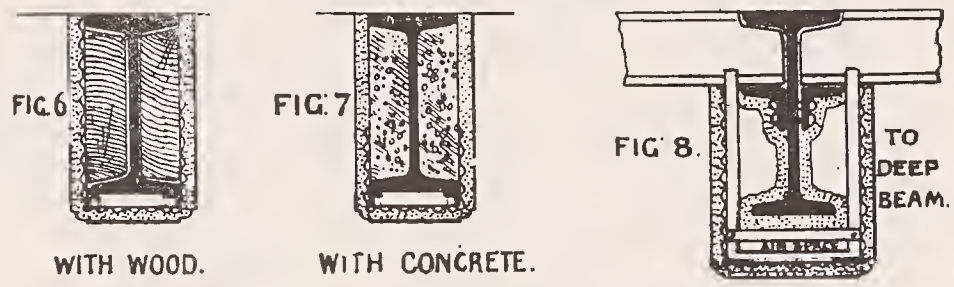


FIG. 5.—SWARBRICK'S FLOOR.

or clay tiles or lintels in combination, judiciously treated, are up to the present time the best materials we know of for forming fireproof floors, although in the United States steel beams and porous terra cotta are more in favor. Flat slab floors of concrete, as Fig. 9, without beams of any kind, simply resting on the walls, have been advocated and adopted to a very limited extent; then, we have steel joists fixed certain distances apart, three to six feet usually, and concrete filled in between level with the top flange and an inch or so below the bottom flange, as Fig. 10—other types of floors consist in embedding iron or steel in the concrete when in a soft state; then we have arched formed floors and level ceilings, as Fig. 11, and lintel floors consisting of clay lintels resting on the bottom flanges of beams or joists, and concrete filled in over as Figs. 14 and 15.

But in selecting one or other of the systems named, or of any



BEAM INCASEMENTS.

other form of construction, the properties of the materials to be employed should be the first consideration.

It is well known that steel beams and joists expand and buckle when exposed to heat, and that in a high temperature the loss of strength is also considerable. These are two disadvantages that can only be remedied in one way, and that is by so protecting them that it shall not be possible in domestic buildings for a fire of one or two hours' duration to injure them. By beams I mean deep single sections, or two or more sections of rolled steel forming compound beams, or riveted plate girders to carry smaller sections which I call joists, the terms being synonymous with those used in wood-floor construction. Where beams are used a portion usually projects below the ceiling line, and have, therefore, a much larger superficial area needing protection than the

*The writer may have been led into error by a misprint, reading "timber" for lumber," as the 80,000 feet of hardwood burned in the Athletic Club building fire consisted of kiln-dried hardwood flooring, which was in matched strips about three inches by one inch in size and twelve feet long.—EDITOR.

joists; moreover, they support a large portion of the entire floor, and should therefore have the greatest possible protection; but instead of this, so far as my observation goes, the usual custom is to wedge light pieces of wood between the top and bottom flanges, about a foot apart, flush with the outside edges of the flanges; to these metallic lathing is nailed, as Fig. 6, and this is plastered in the usual way. When the wood blocks become so hot that combustion ensues, the lath and plaster must inevitably come away, and the beam being exposed it is almost bound to collapse.

The London Building Act permits this arrangement, I believe, in any building. Concrete is sometimes filled in between the top and bottom flanges and metallic lathing fixed thereto and under the bottom flange, as Fig. 7, but it is seldom practical to employ concrete in this way more than three inches thick; it is difficult to apply it in a soft state, and it is moreover a moderately good conductor of heat, and more important than all, the bottom flange of beam is either insufficiently protected or not protected at all. On the other hand, plastering mortar possesses little more than one-third the conductivity of brick or tile, and if applied so as to leave a hollow space behind, an inch and a quarter in thickness of plaster is more effective than two and a half inches of concrete. I am told that asbestic plaster has much less conductivity than common plaster. Sir Eyre Shaw, the former chief of the Metropolitan Fire Brigade, wrote some years since in reply to an inquiry: "Very little plaster will suffice to prevent ironwork from melting, softening or cracking, if only it remains on, but this is the difficulty. Some key is absolutely necessary, and hoop iron or wire netting would probably be found the cheapest and best; with a really trustworthy key about half an inch of plaster would insure safety." When Sir Eyre Shaw wrote this, metallic lathing had not come into use. To ascertain for myself the capability of common plastering to resist fire I built a small brick inclosure seven feet square and six feet high, upon the top of which I laid steel joists and attached thereto a suspended ceiling on expanded metal lathing. When the plaster was thoroughly dry I made a larger fire under than would be likely to occur in an ordinary room, and after two hours of fierce combustion and repeated quenching the upper side of the ceiling with buckets of water, the plastering remained sound, although pieces of wood an inch thick thrown on the top of the ceiling were ablaze in a few seconds from the heat conveyed through the plaster. I am bound to say the result was quite a surprise to me.

The steel joists, although unprotected, were not injured to an extent that would cause them to buckle or expand to any degree, and nearly one hour after the fire was lighted they were but moderately hot.

A further protection may, I suggest, be practiced by plastering the flanges and exposed portions of the beam with asbestic plaster, which I believe adheres better to unpainted metal than to painted.

The diagram, Fig. 8, shows light stirrups, A, made from ¾ by ¼ inch iron, going round the beam, B, suspended to the angle bearer, C, and fixed 12 inches apart; a lighter bar, D, is riveted across the bottom to grip the plastering, E — asbestic is preferred— on the bottom flange as an additional precaution in case of fire to prevent it from falling away. The asbestic on metallic lathing, F, is in this way clear of contact with any portion of the metal. I am unable to speak from experience as to the merits of asbestic, but if the reports concerning it are true, it has some marvelous properties in connection with fireproofing, as regards resistance both to fire and water. Protected in this form, I am strongly of opinion that beams would withstand greater heat than if incased with concrete or terra cotta or fire-clay tiles, say 2 inches thick, as the outer plaster incasement is everywhere disconnected from the beam itself, and forms a valuable and almost invulnerable first line of defense.

Doubt has been expressed whether the heated air between the plastering and the beam would not expand and burst the incasement. I suggest that this can be avoided by fixing an air brick or tube in the walls upon which the beams rest; anyway, it should not be a difficult point to deal with.

Joists in almost every system have their webs incased by the floor materials; the top flanges are much less liable to become overheated than any other portions, but the bottom flanges require greater protection than any other part, as they are at all times subject to a severe tensile strain, and in case of fire the heat is directed full against them. No floor is absolutely safe unless the bottom flanges are efficiently safeguarded. Sir Nathaniel Barnaby, in making experiments in connection with iron ships, found that iron and steel beams gained in strength up to between 490° and 550° Fahr.; beyond this their strength rapidly diminished.

The expansion of steel at 500° Fahr. is 1 inch in 28 feet, and at 1,000°, 1 inch in 14 feet. Iron when dull-red hot is 1,300°. The moral to be derived from these figures is that if the steel beams and joists used in fireproof floors can be so far protected that they do not attain over 500° of heat, there is but little harm either from loss of strength, heat or expansion. Where beams have to be employed I think it is only reasonable they should be no longer than is absolutely necessary, i. e., they should be disconnected at every bearing where possible.

Divided opinions prevail as to whether concrete is reliable as a fire-resisting material or the reverse; this depends mainly upon the materials of which the concrete is made. Thames ballast is one of the worst, and being used at one time for fireproof floors in London, many failures took place, and firemen were cautioned not to enter burning buildings which possessed fireproof floors.

The most reliable fire-resisting materials are crushed bricks, coke breeze, clinker from furnaces, slag from iron ore, pumice and similar substances which have passed through fire. Mr. Webster's experiments proved that slag made the strongest concrete, broken fire brick came next, and then pumice, while coke breeze was the weakest, but after being heated to a red heat, and quenched with water, the order of things was reversed, for it was found that slag had lost two-thirds of its strength, broken fire brick nearly as much, pumice about the same, but coke breeze less than one-half, and that the latter was then stronger than the other three materials. Neat cement was only about one-fifth its original strength after being heated and quenched, but it was clear that when diffused among other materials to form concrete, its strength from some cause or other was not diminished in the same ratio. But good concrete increases in strength with age, and assuming that a concrete floor will sustain the specified load required at a month, it should carry double that at a year, and from this we gather that if a concrete floor made of coke breeze is exposed to a fire, and becomes nearly red hot — say 1,000° Fahr. — it ought to be still capable when cold of supporting its original specified load, subject to not being weakened from other causes. And here another contingency arises — expansion from heat and subsequent contraction, for coke breeze expands about ¾ inch in 28 feet at 1,000° of heat, and crushed brick 1 inch in 28 feet. This appears to be a substantial objection to the use of floors formed of a single slab without joists, or of large self-supporting areas of concrete for floors, whether flat or arched. So far as regards strength, first-class concrete requires no steel beams or joists whatever for floors up to 15 feet between supports, nor any iron embedded therein. I have, many years since, executed 12 feet spans of a uniform thickness, as shown by Fig. 9, of 4½ inches only, but the effect of

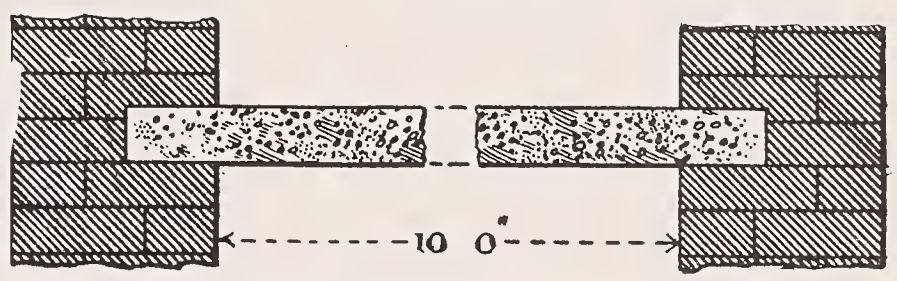


Fig. 9.—Slab or Plate Floor.

a fire would be to cause them to expand, and as they cooled to contract, and, probably through being tied into the walls so as to be unable to adjust themselves to circumstances, they would break up into fragments.

Concrete paths in public streets expand and contract with ordinary variation of temperature, and to avoid irregular cracks they are usually executed, as we know, in sections of about nine feet square.

But as the temperature in a house fire scarcely exceeds, we are told, 1,000 degrees, there should be no difficulty in so protecting the beams, the joists and the concrete, that neither should in an ordinary house be exposed to a temperature of more than 500 degrees one hour or longer after a fire has got well alight.

Cement concrete has some peculiar properties — for instance, it is not considered by any means an elastic material, but I have seen a slab 10 feet in length and 4½ inches in thickness deflect over an inch in the center under a heavy load and resume its original shape within a quarter of an inch, after having been weighted for several days. So that any perceptible movement or deflection of a concrete floor in walking over or jumping upon it does not necessarily imply danger. This is, however, not a pleasant sensation when the floor is known to be of concrete, and to avoid this a flat floor has to be thicker than is absolutely necessary for strength — a segmental arch-shaped floor, as Fig. 12, an advantage in this respect, for no matter how light it may be it is practically rigid.

A flat slab floor without joists has another disadvantage, namely, the effect of ordinary changes of temperature, as before described. The difference of temperature in the rooms of a dwelling is never very great, but combined with the tensile strain on the lower half of the floor it is sufficient to cause slight cracks in the concrete on the under side, as the result of a change from heat to cold, and, although I have never known an accident result therefrom, cracks are naturally looked upon, and with good cause, as signs of danger. These cracks may not develop for a year or more after the floor has been completed, and if they are covered on the top with a wood casing and the under side is plastered, they may never be visible. Then another objection to slab floors is that the lower half, or half below the neutral axis, is undergoing a tensile strain, a strain which concrete is least liable to resist, and these combined disadvantages go to prove that although flat floors of concrete without any joists are economical in cost and space, they are not adapted for rooms of domestic buildings. They may do very well for corridors, passages, lavatories and the like, always remembering that concrete conveys sound more readily than any other building material. As an instance, conversation carried on in an ordinary tone in a room divided from another by a 6-inch concrete partition, plastered on both sides, can be heard in the adjoining room; this I state from experience.

Another type of floor is the same as the one just described, but has steel or iron rods, wire netting, expanded metal, or any other form of steel or iron embedded in the concrete below the neutral axis for the purpose of counteracting the tensile strain. Floors of this character have been advocated for years, more

especially those of Hyatt, Brannon, Monier, Edwards, the Expanded Metal Company, and several others. The main point is to prevent shearing of the embedded material, and this is usually obtained by securing the ends of the metal ties in the concrete. The strength of concrete floors is largely increased this way, but the general disadvantages of the slab floor, just described, are still the same, and if large areas of concrete have to be divided into smaller by means of steel joists, I fail to see much advantage in the use of embedded metal.

(*To be continued.*)

MAKING HUMAN ABODES GERMPROOF.

BY FREDERICK BAUMANN, ARCHITECT.

IT has within the past thirty years become an acknowledged fact that all the different ailments that human flesh is heir to originate from and prosper through the existence of certain microscopic organisms, which encroach upon the human system and may or may not multiply therein enormously. It may be said in regard to them that it appears as though a number of the primeval kinds of organisms, the first upon this earth when its temperature permitted the existence of organic beings, had succeeded in descending to the present day without change, while others were elected to develop into higher and still higher forms till the earth was inhabited as it now is. They remind us not merely of our origin; they have, as it were, primeval rights to assert, and they avail themselves of every opportunity offered for so doing. But, on the other hand, the human body is so constituted that its elementary organisms are its protectors. The blood corpuscles in the man of perfect health will never allow foreign organisms to multiply where they govern. They will fight them on any and every condition, may succeed in dispelling them in spite of their manifold multiplication in impure blood, or they may be overcome so that death will be the issue.

Civilized man has undertaken the imperative duty of guarding his health. Modern society has acknowledged this duty, has done more than this by instituting departments of health in cities everywhere in the civilized world. An active tendency prevails in all these cities to purify thoroughfares and supply an abundance of pure water. It is provided that all new buildings shall be constructed in accordance with certain prescribed sanitary rules. The general result has been a pronounced reduction of the death rate. A desire has everywhere been implanted for promoting progress on this line. It is the pronounced object of this paper to gratify, as may be hoped, this general desire, and it is expected that all well-to-do citizens will henceforth feel induced to set the example of adopting for their intended new edifices a judiciously laid-out system of protection against the encroachments of all species comprised under the head of "bacilli." The expense will be trifling, the result gratifying. Authorities may be induced to so ordain.

The average bacillus, though a living organism built up out of millions of molecules, is so infinitesimal in size that it requires the enormous number of, say, 30,000,000,000 of them to make up the weight of a milligram — the sixty-sixth part of a grain! Such a figure is beyond all comprehension. We may approach it by comparing our bacillus with an average grain of sundust, so-called, which we succeed in perceiving with the naked eye. The authority giving the weight of a bacillus states that of such a sundust grain to be a one hundred thousandth part of a milligram, which makes it 300,000 times greater than that of our bacillus. By means of this comparison we comprehend its dimensions as being so minute that *it could move within the interstices of ordinary brick sand as freely as can a fly within a living room.* Hence we arrive at the conclusion that the interstices prevailing in ordinary building material, in concrete, plastering and the like, *are very ample in size for the freest passage of a bacillus*, which, therefore, may at any time freely pass into all buildings. Many thousands of all kinds of bacilli may thus, within a comparatively brief space of time, ascend into the rooms of a domicile, hospital, asylum, dormitory or any other kind of inhabited building, especially so in winter when warm air therein causes ascending currents, and thus sucks up, as it were, the air from the ground and with it the bacilli and all obnoxious matter in it contained.

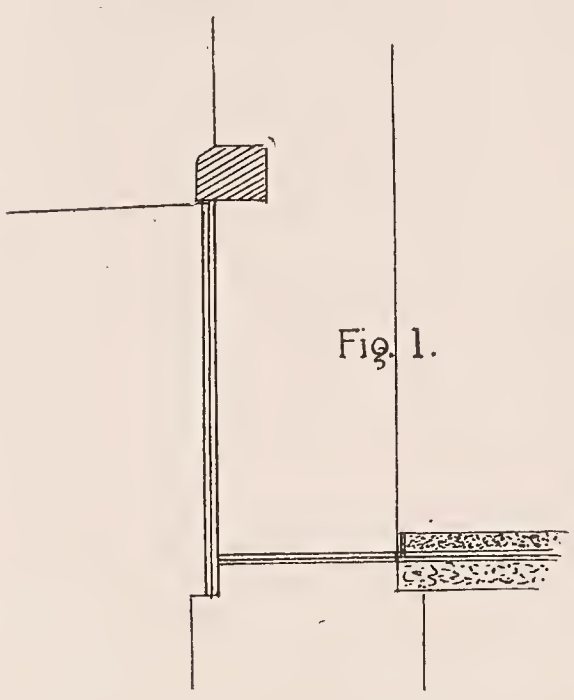


Fig. 1.

Though the general class of bacilli arising from the ground and passing with the atmospheric air through the alveoles of the lungs into the blood is not regarded as especially poisonous, particularly so during the winter season, a large number of them might, nevertheless, enhance the slightly deleterious effects caused by germs of another class. Nay, under special conditions, the secret of which has not yet been fully uncovered, they do, it would seem, here and there assume a positively poisonous character. Chicago is generally free from ordinary fevers; yet in 1872 it was visited by a common fever plague, as though the bacilli arising at the time from the soil had by some unknown cause assumed a poisonous condition. A few years later a similar, still more pronounced fever epidemic visited some parts of Massachusetts, otherwise notoriously healthy. It may be assumed that related cases are on the medical records.

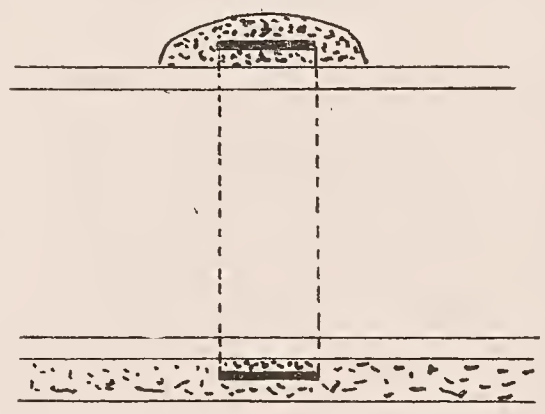


Fig. 2.

MAKE PREPARATIONS.

"If thou art desirous of peace, prepare for war." This time-honored proverb is, in a sense, applicable also to human abodes, invaded, as ever they are, by manifold germs, harmless or poisonous, as the case may be. In the free atmosphere such germs are blown about by the winds; but within the walls of a house they are slowly moving about and accumulating. I believe it to be very important to prepare for keeping them out, which can be readily accomplished without great expense. It requires but a determined will and positive care, such as ever are required in the construction of an important building.

Among the common materials applicable for the purpose of preparing a building germproof as against the ground upon which it stands, are: *glass;* with thin well pressed *plates* of *asphaltum; pitch tar*, *rolled lead*, and some others. When foundations are completed the resisting material is spread upon them in two thicknesses having an adhesive substance between. The exterior face, from the lower edge of the basement floor to that of the ground water table, is protected by attaching a double sheathing of asphaltum plates, and the floor is treated in manner following:

A common concrete is laid upon the ground and brought to a level surface. This is covered with a uniform coat of pitch tar. Follow it with a layer of tarred felt paper; then with another coat of the tar, and thereon with a second layer of felting tucked up against the wall faces at a level, being a few inches above the course of obstructive material first laid upon the foundation walls.

The sectional drawing (Fig. 1) here given, serves to explain the processes set forth. The place assigned for boiler or furnace should receive a large sheet of lead as additional safeguard, upon the very spot where heat otherwise might make tar and paper alone inefficient. The floor is now ready to receive its finish, be this concrete alone or concrete with sleepers and flooring.

SEWERS AND WATER PIPES.

But all safeguards would, at least to an extent, be without the desired effect, if the several water-service and drain pipes are not correspondingly treated. The floor protection should by all means be kept intact. Neither should the ground underneath it be saturated with sewage soil oozing out from pipes recklessly laid, as generally they are. Even iron sewerage is objectionable. Excremental matter has a strong corrosive effect upon them. Their inner surface gets rough, and conveniences for cleaning must be had, though our safeguard be therewith broken. Glazed drain pipes of best quality are by far of the best service, provided they are applied in the following manner: Trenches to be at once excavated to their full extent, and a sort of concrete is spread upon them for assuring a uniform incline. Thereon the pipes are laid, bedded in cement mortar. They are connected by means of special *iron rings* applied in halves. The lower half is laid first, and after the pipes have been laid thereon, the upper half of the ring is slid into the hooks of the lower half, made tight and covered with cement. Fig. 2 gives an illustration of the case.

Each turn-up terminates with a usual socket, which affords chance for laying therein a cast-iron lid with opening for soil or waste pipe to pass through. Such pipe rests upon the lid by means of a special stop applied, and the space around it is made tight by an abundant covering of pure Portland cement. Sewerage thus prepared may well be considered as perfect and permanent, while the much costlier iron sewer pipes are subject to a constantly active cause of decay, and hence not permanent.

Water-supply pipes should not be distributed below the floor of basement and thus pierce the concrete at a number of places. The place of entry, when below the floor level, should by all means be carefully protected, and pipes carried to their respective places by attaching them to the ceiling.

No thoughtful citizen should henceforth have his domicile—no authority any hospital, dormitory, asylum or cognate institution under its charge, erected without the application of those safeguards to well-being set forth in this article. Even if it could rightly be pretended that their contribution to general health were without avail, their application would at all events indicate a thoughtful care for health and well-being, such as ever has been and ever will be a pronounced factor in civilization.

A BRIGHT, CLEAN AND BRILLIANT CITY.

COLOR, durability and cleanliness are today most important considerations, from the standpoint of the architect, in exterior construction, especially for city fronts. Even the most casual non-professional observer cannot fail to have noticed the dull sameness and uniform dinginess of the average row of buildings on a business street. Red brick and gray stone are the prevailing colors, and after the changes have been rung on these in a few commonplace combinations there is little left to delight or rest the eye, or ornament the altogether prosaic scene, unless the buildings be painted from top to bottom, which is a yearly expense in a city like Chicago. It is as if the art of architecture were confined to the mere piling of stone upon stone or brick upon brick, without regard to the effects of light and shade, until nearly all consideration of color has been lost. Such heretofore has been the tendency of commercial architecture.

Happily, there is now coming a new era of rational decoration, which concerns itself quite as much with color as with form. Thanks to the production of new or improved building materials, the architect is no longer left to the device of mere form to redeem his fronts from the accusation of commonplaceness. He now has at his command all the colors, and can make any and all combinations both of form and color that he may desire. The difficult problem has been solved by the manufacture of a strictly high-grade enameled brick, both in the glazed and dull finish, and of all colors.

Imagine, if you can, a row of business structures with fronts made entirely of these enameled bricks. What a contrast to the ordinary dull and uninteresting city block! The first feature to attract the attention would be the variety of design and of coloring, for each separate building would have been the object of a distinct color scheme, according to the idea of the architect who planned it. But all would be alike in one important particular—the harmony of color. Instead of the glaring contrast which is now observable where pressed brick and the various dull stones are the only available materials, there would be a careful selection of such tints as, taken together, would create a beautiful and harmonious effect. The architect could give free rein to his ideas in devising ornamental color schemes suited to the particular construction in hand.

This desirable condition is now quite possible by the use of enameled brick. These brick, the best of which are of American manufacture, were originally made in a brilliant glazed white for use in alleys and light courts, but are now made also in any color desired and either glazed or unglazed. The latter, known as the dull finish, are particularly desirable for fronts, because they preserve, under all conditions of light, the beautiful color effects which the glaze (the glare from which is so objectionable to architects) not infrequently would hide or detract from. At the same time the unglazed brick are just as impervious to moisture and dirt and as readily cleaned. The durability of both the glazed and unglazed brick has been so well demonstrated to architects as to need no extended comment in this connection. They have been repeatedly frozen and boiled alternately—also heated to a red heat and then plunged into cold water, without injury, the important point being that the enamel has been demonstrated by these tests to be part of the brick itself and not a mere cleavage. Thus they are seen to be not only fireproof, but absolutely indestructible by any combined force of fire and water.

As to the comparative cost. Enameled brick laid in the wall cost less than 60 cents per superficial foot, being a little cheaper than good Bedford stone, while their advantage over this material is that they are fireproof and can be easily and cheaply cleaned. Where it may be desired to put an addition either on top of a building or adjacent to it, any colors can be duplicated, and after the entire wall is washed down, the building will be uniform in appearance, the new and the old alike, which would be impossible with materials which absorb dirt or have to be painted. The advantages of cleanliness are not of least consideration in alleys, light courts and basements, where they are especially valuable for sanitary reasons. They can be washed down as frequently as desired, and dark places made light and healthful. In England, the home of the enameled brick industry, the municipal laws require their use in alleys and courts on account of their sanitary qualities.

The foregoing statements as to the perfection arrived at in the production of American enameled brick, including their durability, beauty and variety of color and shape, their bright and dull finish, as well as the severe tests mentioned, are based on facts obtained from an investigation of the attainments of the Tiffany Enameled Brick Company, of this city. Their brick are made in all sizes and shapes usually desired by architects, and may be ground perfectly for high-grade archwork. English, American and Roman sizes are made in stretchers, quoins, octagon, round end, etc., and can be enameled on both faces, when required, for thin partition walls. Any color can be produced to order, with certainty as to uniformity of shade. Being evenly enameled and very hard, the edges and corners are true and the body of the brick smooth and compact; they can also be cut by the mason when necessary, without flaking off, and are superior on account of the perfection and trueness of the brick, as well as the evenness of the enameled surface, enabling them to be laid with a closer joint than those of other make, and avoiding the waviness noticed in the surface of most other enameled brick.

The Tiffany Company is now manufacturing also a very superior quality of tile with a dull finish for inside work, which are especially suitable for hearths, mantels, wainscoting, etc., where on account of less reflection the colors show to better advantage. These tile, as well as their brick, and also an open court of sixteen stories faced with the Tiffany enameled brick, may be inspected at the company's office in the Marquette building, where all architects and builders are welcome.

CAMBRIA IRON COMPANY.

THE Cambria Iron Company, whose works are situated at Johnstown, Pennsylvania, and general office at Philadelphia, Pennsylvania, is one of the oldest and largest steel producers in the world, with an annual capacity of about five hundred thousand tons of finished product, has lately added a structural department to its works and is now engaged in supplying finished structural steel and iron work for buildings, including I-beams, channels, angles, steel and iron columns, girders, roof trusses, etc., all of which are furnished, fitted and framed complete, ready for final erection in place in the building.

This company has unusual facilities for steel production, as it owns its own ore properties in Michigan and Minnesota, coal and coke works in the Connellsville region, and its coal mines at Johnstown produce all of the steam coal required there, from mines immediately adjoining its works, supplying 1,500 tons per day for this purpose alone.

In addition to having its own supply of raw material, this company has exceptional facilities for finishing and converting them into the final forms in which they are ultimately used and has recently made additions to its mills whereby it is able to produce steel I-beams of all sizes from three inches to twenty-four inches in depth, and in addition, a full line of angles, channels, Z-bars, T-bars, rounds, squares, flats and other structural shapes.

The new structural shops of this company, which will shortly be completed, will have a capacity of about three thousand tons of finished product per month, and are modeled with all the most recent and improved tools and labor-saving appliances.

Supplementary to the fitting shop is a large stock yard covering a space of two hundred feet wide by about one thousand feet long, in which is stored the various materials needed for the shop's supply. A large stock of ordinary sections is maintained, thus rendering it possible to meet ordinary requirements quite promptly.

Since beginning this work last summer this company has furnished the fitted structural material for a number of buildings, among which are the following: William Frear Building, Troy, N. Y.; Starke County Courthouse, Knox, Ind.; Cincinnati & Covington Bridge (blow system), Wilmington, Del.; Grant Building, Atlanta, Ga. (ten stories); Museum of Science and Art, University of Pennsylvania, Philadelphia, Pa.; Pennsylvania Institution for the Blind, Overbrook, Pa.; Majestic Apartment House, Atlanta, Ga.; Hartford National Bank, Hartford, Conn.; Cambria Brewery, Johnstown, Pa.; Woodside Casino, Philadelphia, Pa.; Briggs, Ellis & Co., Oil Refinery, Warren, Pa.; Schneider Building, Washington, D. C.

A few of the contracts which are now under way are as follows: Johnstown High School, Johnstown, Pa.; Ellis Building, Johnstown, Pa.; Latrobe Brewery, Latrobe, Pa.; New Castle Brewery, New Castle, Pa.; American Express Company's Building, Worcester, Mass.

While this company makes a specialty of steel frame buildings of modern construction, it is also prepared to furnish lattice girder work for bridges.

TIME EXTENDED.

COMPETITIONS, whether strictly architectural or having also a commercial blending, are practically of the same nature, for the one may be as ethereal or as practical as the other. The art of applying materials to definite purposes requires the exercise of the trained and studious mind, of one skilled in architecture and imbued with the harmony of colors and of forms—in other words, an active appreciation of art. The mere pencil-sketcher cannot rise to the occasion.

When problems are presented to the workers in the allied arts for solution, and compensation equal to a five per cent commission on $40,000, $20,000, $10,000, $6,000, $4,000 and ten $2,000 modern residences is offered, it would seem to be a most engaging proposition and one well calculated to stimulate the minds of many architects who, during these days of war and victory, find time a little heavy on their hands. Inasmuch as the architect cannot go to the front to face the enemy, let him fight out the problem of the proper application of Luxfer prisms, getting away from his professional dreamland and reaching out into the practical demonstration of principles which have already been proven to be excellently founded.

To make this possible, the adjudication committee, whose names are subjoined hereto—gentlemen of the highest integrity

and who are so well known to the architectural profession as to need no further comment — have extended the time for competition to June 15. The details of this competition were published in the January issue of THE INLAND ARCHITECT. Notice of such extension is as follows:

CHICAGO, April 15, 1898.

The undersigned Committee of Award selected by the American Luxfer Prism Company to pass upon the merits of the designs submitted in competition, in accordance with its invitation published and circulated, have decided not to examine the designs on file at this time, but to give additional time until June 15.

The reason for this action is that it has become very apparent that the time previously allotted has not been sufficient for the architects desiring to compete to satisfactorily investigate and study the possibilities of daylight illumination in relation to architectural design and at the same time execute the orders in hand.

It is the desire of the American Luxfer Prism Company to give the fullest opportunity to the architectural profession who desire to take part in this very interesting competition.

D. H. BURNHAM,
W. L. B. JENNEY,
WILLIAM HOLABIRD,
FRANK L. WRIGHT,
HENRY CREW.

OUR ILLUSTRATIONS.

House at Cranford, New Jersey. E. G. W. Dietrich, architect, New York City.

The Amsterdam Gate, Holland. Frank D. Shaw, del.; Drexel Institute, Philadelphia.

Sketch of House for Clayton E. Bailey, Jamestown, New York. E. G. W. Dietrich, architect, New York City.

United States Post Office and Courthouse, Chicago. Henry Ives Cobb, architect. Details of Truss Construction. Details of Granitework.

United States Immigrant Station and Hospital, Ellis Island. Boring & Tilton, architects, New York City. General bird's-eye perspective.

From Architectural League Catalogue for 1898: Buffalo Savings Bank, Accepted Design, Green & Wicks, architects; Schoolhouse, Boring & Tilton, architects, New York; Sketch of Proposed House at Albany, New York, Wilson Eyre, Jr., architect, Philadelphia; Church of Our Saviour, Middleboro, Massachusetts, Cram, Wentworth & Goodhue, architects, Boston; Residence, Nettleton, Kahn & Trowbridge, architects, Detroit; Rawitser Building, New York, Brunner & Tryon, architects; College of the City of New York, Accepted Design, George B. Post, architect; House for Rev. George W. Douglass, D.D., R. Clipston Sturgis, architect.

PHOTOGRAVURE PLATES.

Issued only with the Photogravure Edition.

Three Cottages at North Evanston, Illinois. Robert C. Spencer, Jr., architect, Chicago.

Residence of A. S. Van Deusen, Evanston, Illinois, Myron Hunt, architect, Chicago.

Residence of Mrs. Frank Bradley, Evanston, Illinois. W. Chester Chase, architect, Boston.

Residence of Edwin F. Brown, Evanston, Illinois. Handy & Cady, architects, Chicago. Two full-page views are given: Southeast View, Southwest View.

Residence of C. M. Howe, Evanston, Illinois. Pond & Pond, architects, Chicago. The following full-page plates are given: Exterior View, View in Library, View in Dining Room.

SYNOPSIS OF BUILDING NEWS.

Architects are invited to furnish for publication in this department monthly or occasional reports of their new work before the letting of contracts. Reports of buildings costing less than $5,000 are not published.

Chicago, Ill.— Architect George C. Nimmons made plans for a four-story and basement apartment building, 62 feet front and 125 feet deep; to be erected at 109 East Forty-seventh street for Mrs. Amelia Proby; it will have a handsome front of rock-faced buff Bedford stone basement and first story, and the remainder will be of buff pressed brick with cut-stone trimmings, the interior to be finished in quarter-sawed oak and other woods, have the best of open nickel-plated plumbing, gas and electric fixtures, gas ranges and fireplaces, laundry fixtures, hot-water heaters, electric light, steam heating, marble wainscoting, cement basement, electric bells and speaking tubes, etc.; cost $30,000.

Architect Ernest A. Mayo made plans for a pretty two-story, basement and attic residence, 34 by 60 feet in size; to be erected at Battle Creek, Michigan, for H. B. Sherman; it will be constructed of pressed brick with stone trimmings and slate roof, have the interior finished in quartered oak, birch, sycamore, bird's-eye maple, mahogany, marble wainscoting, marble and tile bathrooms, open nickel plated plumbing, gas and electric fixtures, electric light, cement basement and sidewalks, laundry fixtures and hot-water heater, steam heating, electric bells and speaking tubes; cost about $9,000. Same architect made plans for a two-story, attic and basement residence, 32 by 60 feet in size; to be erected at Cassopolis, Michigan, for Grenville S. Smith; the first story will be of stone and the remainder of frame construction; will put in hardwood finish, nickel-plated plumbing, hot-water heating, gas and electric fixtures, mantels, sideboards, consoles and hall trees, marble and tile work, laundry fixtures, electric bells and speaking tubes; the cost will be $7,500. For William R. Cregier, a two-story, basement and attic residence, 34 by 36 feet in size; to be erected at Highland Park; to be of frame construction with pressed brick basement, have oak finish, gas and electric fixtures, mantels, sideboards and consoles, electric light, hot-water heating, laundry fixtures, electric bells, cement basement and sidewalks, etc.

Architect Charles W. Melin: For A. W. Waldman, a three-story hotel, 43 by 61 feet in size; to be erected at 3089-3091 Evanston avenue; it will be of frame construction, with brick basement, have oak and pine interior finish, gas and electric fixtures, steam heating, electric light, modern plumbing, cement basement and sidewalks, etc.

Architects J. F. & J. P. Doerr: For Henry Feil, a two-story, basement and attic flat building, 28 by 80 feet in size; to be erected at 6022 Michigan avenue; it will have a brownstone front, tile tower and roof, oak and mahogany finish, mantels, sideboards, steam heating, electric wiring, marble wainscoting, etc.; cost $12,000. Same architects are making plans for a three-story and basement apartment building, 88 feet front; to be erected on Sixty-sixth street; it will be of stone and pressed brick, have the best of improvements, steam heating, electric light, etc. For P. Kavanaugh, a four-story store, flat and hall building, 55 by 78 feet in size; to be erected at Ninetieth street and Commercial avenue; to be of pressed brick and Bedford stone trimmings, have oak finish, gas and electric fixtures, steam heating, cement basement and sidewalks, electric light, etc.; cost $25,000.

Architects Julius Speyer & Son: For Mrs. L. E. Welch, a three-story store and flat building, 27 by 80 feet in size; to be erected at 8957 Buffalo avenue; to be of pressed brick and stone front, have the modern plumbing, gas fixtures, steam heating, mantels, etc.

Architects J. E. & O. Pridmore: For F. B. McClelland, a three-story apartment house, 48 by 115 feet in size; to be erected at 6502 Greenwood avenue; to be of pressed brick and stone front, have oak finish, the best of modern sanitary improvements, gas and electric fixtures, steam heating, marble, tile and mosaic work, cement basement and sidewalks, gas ranges and fireplaces, electric light, etc.

Architect W. J. Van Keuren: For T. E. Gilpin, a three-story residence, 21 by 50 feet in size; to be built at South boulevard and Central avenue; to be of stone and pressed brick front, have the best of plumbing, gas and electric fixtures, oak finish, mantels, consoles, hall trees, sideboards, electric light, etc. Same architect is making plans for a two-story, attic and basement residence, 25 by 55 feet in size, to be erected at Jackson boulevard near Forty-third avenue; to be of pressed brick and stone front, have oak finish, gas fixtures, furnace, mantels, sideboards, consoles, laundry fixtures, marble work, electric wiring, etc.

Architect Paul Hansen: For Louis Nielsen, a three-story store and flat building, 33 by 80 feet in size; to be erected at the northeast corner of Chicago avenue and Fifty-third avenue, to be of pressed brick front with buff Bedford stone trimmings, have oak finish, gas fixtures, steam heating, electric wiring; cost $13,000.

Architects Patton, Fisher & Miller: Made drawings for the rebuilding of the six-story building at 118-120 Monroe street, for E. C. Southworth; the front will remain as at present, but all the rest will be new; the cost will be about $40,000. William Mavor & Co. have the contract.

Architect Joseph T. Fortin: For E. Elpin, a two-story and basement flat building, 22 by 65 feet in size; to be built at 311 Monroe street; Bedford stone front, steam heating, plumbing, mantels, gas fixtures, etc.

Architects Stiles & Stevens: For Frank Eldred, a two-story, basement and attic residence, 32 by 40 feet in size; to be erected at Irving Park; frame, stone basement, oak finish, gas fixtures, furnace, modern open plumbing, laundry fixtures, etc.; cost $6,000. For Thomas Edgar, a two-story, basement and attic residence; to be built at Irving Park; frame, stone basement, hot-water heating, gas fixtures, mantels, sideboards, nickel-plated plumbing, etc.

Architect J. G. Simpson: For C. W. Hoff, a four-story and basement apartment house, 75 by 90 feet in size; to be erected at Grand boulevard near Forty-third street; it will have a buff Bedford stone front, the interior to be finished in oak and Georgia pine, have specially designed mantels, sideboards, consoles, hall trees and grillwork, gas and electric fixtures, gas ranges and fireplaces, open nickel-plated plumbing, laundry fixtures and hot-water heaters and driers, steam heating, electric light, marble wainscoting, tile and mosaic floors, gas ranges, etc.; cost $60,000. Same architect is making making plans for two handsome three-story residences, semi-detached, 47 by 68 feet in size; to be erected at Forty-fourth street and Vincennes avenue; Bedford stone front, hardwood finish, special mantels, consoles, hall trees, grillwork, sideboards, open nickel-plated plumbing, gas and electric fixtures, gas ranges and fireplaces, hot-water heating, electric light, marble wainscoting, tile and mosaic floors, cement sidewalks and basement, laundry fixtures and driers; cost $22,000.

Architects Filizowski & Kaiser: For Henry Wasterbarth, a two-story, basement and attic residence, 26 by 60 feet in size; to be built at Gracelaud avenue, Ravenswood; the front will be of buff Bedford stone, the interior to be finished in hardwoods, have gas ranges, gas fixtures, furnace, mantels, sideboards, consoles, etc.; cost $12,000.

Architect Oscar Lievendahl: For Andrew Johnson, a three-story and basement apartment house, 85 by 100 feet in size; to be erected at the northwest corner of Buena Terrace and Hazel street; to have two fronts of buff Bedford stone and pressed brick, hardwood interior finish, mantels, consoles, sideboards and grillwork, gas and electric fixtures, gas ranges and fireplaces, steam heating, electric light, marble, wainscoting, mosaic floors, tilework, laundry fixtures and driers; cost $45,000.

Architect Normand S. Patton is making plans for a school for blind children, to be erected at West Nineteenth street near Southwest boulevard; it will be two stories and basement, of preesed brick, stone and terra cotta front, slate roof, have interior in Georgia pine and oak, cement basement and sidewalks, gas and electric fixtures, plumbing, steam heating. Same architect is preparing drawings for a three-story and basement high school, to cost about $100,000, to be erected at Orchard street and Center street; pressed brick, stone and terra cotta, oak and pine finish, modern plumbing, gas fixtures, steam heating, cement basement and sidewalks, electric light, marble and tile work, etc.

Architect William H. Pruyn: For C. J. Atkins, a three-story and basement residence; to be erected at Garfield boulevard near Marshfield avenue; to be of buff Bedford stone front, have slate roof, fine hardwood finish, mantels, sideboards, hall trees, consoles and grills, gas and electric fixtures, gas ranges and fireplaces, hot-water heating, electric light, laundry fixtures; cost $10,000.

Architects Flower & Hayes: For I. Parish, a three-story flat building, 25 by 60 feet in size; to be built at Racine avenue between Garfield avenue and Center street; to be of pressed brick and stone front, have oak finish, mantels, gas fixtures, furnaces, etc. For Rev. Walter Walker, a three-story flat building; 50 by 60 feet in size; to be erected at Edgewater; to have a front of buff pressed brick, with buff Bedford stone trimmings, oak and Georgia pine interior finish, mantels, gas fixtures, steam heating, electric light, marble wainscoting, mosaic floors, etc.

Architect Simeon B. Eisendrath has completed drawings for the Jewish Orphan Asylum, to be ereeted at Drexel avenue and Sixty-sixth street; it will be three stories and basement; 60 by 148 feet in size; to be constructed of pressed brick and stone, have the best of sanitary improvements, ventilating arrangements, steam heating, electric light, marble work, cement basement and sidewalks, etc.; cost about $60,000.

Architect George W. Maher has laid the corner stone for the magnificent home which John Farson is building at the corner of Pleasant and Home avenues, Oak Park; it will be 40 feet wide and 90 feet long, of brick, plaster and cut stone, have fine hardwood finish, steam heating and electric light. Also making plans for remodeling residence in Buena Park; new front of wood and plaster, new plumbing, heating, electric light, etc.

Architects Wilson & Marshall: For Frank Epps, two three-story residences; to be erected at Grand boulevard and Forty-fifth place; to have handsome fronts of buff Bedford stone, hardwood interior finish, gas and electric fixtures, gas ranges and fireplaces, specially designed mantels, consoles, hall trees, sideboards, steam heating, electric light, marble and mosaic and tile work. For Matson Hill, five one-story stores; to be erected at Sixty-first street and Indiana avenue.

Architects Frost & Granger: Are preparing drawings for the Union Station, to be erected at Omaha, for the Union Pacific Railway Company; it will be used by several roads and will be 78 by 260 feet in size, besides baggage and express buildings; the entrance will be two stories high, of pressed brick, stone and terra cotta; will put in oak finish, marble, mosaic and cement work, electric light, steam heating, plumbing, etc.; cost $150,000. Same architects have just let contracts and commenced work on the Midlothian Golf Club, at their grounds (40 acres) south of Blue Island; it will be in the Colonial style of architecture and cost about $25,000.

Architects D. H. Burnham & Co.: Have completed drawings for the Northwestern University building (Fisk Hall); to be erected on the University grounds; it will be four stories and basement, of pressed brick, stone and terra cotta, with tile roof; have hardwood interior finish, plumbing, steam heating, electric light, etc.; cost about $65,000. Same architects are finishing

drawings for the two-story and basement school to be erected at Inman avenue, Evanston; it will be constructed of pressed brick, stone and terra cotta, with tile roof, plumbing, electric light, steam heating, etc.; cost $35,000.

Architect W. M. Walter: For C. H. Dennis, a three-story residence, 31 by 70 feet in size; to be erected at 1893 Roscoe street; to be of pressed brick and stone front, slate roof, hardwood finish, have the best of nickel-plated plumbing, gas and electric fixtures, special mantels, consoles, sideboards, electric light, steam heating, marble, tile and mosaic work etc.; cost $10,000.

Architects Brainerd & Holsman: For A. B. Mulvey, a two-story, basement and attic residence, 32 by 46 feet in size; to be erected at Fifty-first street and Cornell avenue; to be of pressed brick and stone front, have hardwood finish, mantels, hall trees, consoles, gas and electric fixtures, steam heating, electric light, marble work; cost $6,000. Also making plans for three-story addition, 62 by 100 feet in size, for University of Nebraska; pressed brick and stone, plumbing, electric light, etc.

Architect H. J. Schlacks: Made drawings for the three-story addition and remodeling Guardian Angel German Catholic Orphan Asylum, at 401 Devon avenue, High Ridge; to be of pressed brick and stone, have steam heating, plumbing, electric light, etc.; cost $15,000. Same architect made plans for the store and café, 95 by 128 feet in size, now being erected at 3854 Vincennes avenue, for the Tosetti Brewing Company.

Architects Healey & Gilbert: Made plans for a three-story and basement apartment building, 100 by 140 feet in size; to be erected at the southeast corner of Forty-fourth street and Oakenwald avenue; to be of pressed brick and stone front, have hardwood finish, gas and electric fixtures, mantels, gas ranges, hall trees, consoles, steam heating, electric light, laundries, etc.; cost $50,000

Architects Huehl & Schmid: For Mrs. Knauer, a four-story and basement flat building, 25 by 50 feet in size; to be built at La Salle avenue near Superior street; pressed brick and stone front, steam heat, electric light, etc. For William Dickinson, at Fox Lake, Illinois, a two-story frame residence, 40 by 60 feet in size.

Architect Charles Furst: For Heissler & Junge Company, a three-story office and warehouse, 58 by 111 feet in size; to be erected at 353-357 Thirty-ninth street; pressed brick and stone front, steam heating, electric light, etc.; cost $20,000.

Architect R. T. Newberry: Made plans for handsome three-story residence, to cost about $20,000, to be erected at Erie and St. Clair streets, for himself; it will be of pressed brick and stone, in the Colonial style of architecture, have cabinet finish, all nickel-plated plumbing, hot-water heating, electric light, etc.

Architects I. K. & A. B. Pond: For F. I. Carpenter, a three story residence, 42 by 42 feet in size; to be erected at 5531 Woodlawn avenue; to have paving brick front, slate roof, hardwood finish, gas and electric fixtures, gas range, hot-water heating, electric light, etc.; cost $12,000.

Detroit, Mich.—Architects H. C. Varney & Co.: For Lawrence Depew, four-story buff pressed brick and cut stone apartment house; composition roof, hardwood finish; 42 by 75 feet in size; cost $18,000. For Mrs. Laura M. Smith, two-story brick double residence; cost $7,000. For Albert Seely, two-story frame residence; cost $5,000. For Detroit Steel & Spring Works, brick office building; cost $5,000. For H. P. Dayton, two-story brick double residence; cost $5,000. For F. Smith, two and one-half-story frame residence; cost $5,000.

Architect Richard E. Raseman: For Mrs. William Goldsmith, brick and frame two-story residence; cost $10,000.

Architects Donaldson & Meier: For St. Elizabeth's Catholic Church, two-story frame parish building, with brick foundation, containing the customary conveniences of a clubhouse; 55 by 112 feet in size; cost $5,000.

Architects Grenier & McLean: For James J. Hayes, two and one-half-story brick residence; equipped with all modern conveniences; cost $6,000.

Architect R. Arthur Bailey: For M. H. Marvin, Augusta, Michigan; two and one-half story residence; of stone on first story and shingles above; cost $7,000.

Architect S. C. Falkinburg: For E. W. Wardell, two-story brick veneered double residence; cost $5 000.

Architect A. E. French: For Samuel R. Bateson, two three-story brick residences; of buff pressed brick and Berea cut sandstone, with galvanized iron cornice; cost $10,000. For Lawrence E. Fitzpatrick, two-story block of brick stores and apartments; of buff pressed brick and Berea cut sandstone, 30 by 70 feet in size; cost $8,000.

Architect Thomas P. Oglesby: For Onesime Nantau, two-story pressed brick double residence, to be finished in hardwood; cost $6,000.

Architects Rogers & MacFarlane: For Heineman Estate, "Arcade" building; of buff pressed brick and ornamental pressed brick and blue cut stone, and be finished with hardwood; 50 by 65 feet in size; cost $15,000.

Architect Max J. L. Towler: For Max J. L. Towler, three-story residence of brick and frame; 60 by 71 feet in size; cost $12,000.

Architect George Zimmerman: For Henry G. Weideman, two-story brick double store and residence flats; 50 by 56 feet in size; cost $5,000.

Architect Alphonso Van Deusen: For Fred E. Gregory, block of two two-story brick stores and residence flats; cost $6,000.

Company's Engineer: For United States Heater Company, one-story brick factory; 120 by 158 feet in size; cost $5 000.

Architect C. A. Goff: For Quinn & Haggerty, five two-story frame residences; cost $9,500.

Architects John Scott & Co.: For George H. Barbour, five story brick office building, 50 by 70 feet in size; cost $20,000.

Architects Malcolmson & Higginbotham: For Detroit Soap Co., four story brick factory; cost $10,000.

Architect Thomas M. Worden: For Luther Lathrup, two-story brick-veneered apartment house, 80 by 70 feet in size; cost $8,000.

Architect M. L. Smith & Son: For Fred Postel, two-story addition to the Griswold House; cost $20,000.

Architect Joseph E. Mills: For M. W. & J. F. Dinan, eight frame residences; cost $11,200 For Adam J. Dorr, two-story brick-veneered double residence; cost $5,200. For Alex I. McLeod, two-story brick-veneered residence; cost $5,000.

Architect John Scott & Co.: For Trangott Schmidt Est., Wonderland Theater and Musee; 75 by 100 feet in size; cost $15,000.

Architect Spier & Rohns: For Leo Straehl, two-story red pressed brick building for an entertainment hall; 54 by 90 feet in size; cost $11,000.

Architect Louis Kamper: For Marvin M. Stanton, three-story Bedford blue limestone and red pressed brick residence, with tile roof and finished in selected hardwood; heating by hot water; 112 by 107 feet in size; cost $15,000.

Architects Kastler & Hunter: For Thomas Zoltowski, block of two-story pressed brick and cut-stone stores and apartments, slate and composition roof, finished in hardwood; 54 by 81 feet in size; cost $14,000. For Dr. Harry P. Mera, three-story pressed brick residence, with cut-stone trimmings, hardwood finish; cost $8,700.

Architect Frank G. Baxter: For James M. Munro, two two and a half story brick and stone residences; cost $15,000.

Architect Edward C. Van Leyen: For Alfred A. Gray, four-story apartment house of gray and red pressed brick and Bedford buff limestone, tile roof and hardwood finish; 45 by 100 feet in size; cost $30,000. For Harry F. Chipman, two story frame residence, with brick foundation; cost $5,000.

Architects Malcolmson & Higginbotham: For Eleventh Ward, twelve-room school building; 96 by 138 feet in size; cost $30,000. For Seventeenth Ward, twelve-room school building; 107 by 117 feet in size; cost $30,000.

Architect Richard E. Raseman: For Mandell Estate, transform three stores into a hotel; cost $20,000.

Architects Grenier & McLean: For Dr. Arthur Lefebvre, two and a half story buff brick and cut-stone residence, heated by steam; 59 by 67 feet in size; cost $10,000.

Architects Donaldson & Meier: For Parke, Davis & Co., three-story brick laboratory; 60 by 90 feet in size; cost $10,000.

TRADE NOTES.

The Buffalo Down Draft Forges have within the past few years fairly revolutionized smithshop equipment in representative new shops, and in many old ones. The feature of removing the smoke immediately as generated at the fire without the possibility of being allowed to escape into the rooms, maintaining as pure air in the forge shop as in the best-ventilated machine shop, is one which is at once appreciated and commends their use. The overhead system of smoke removal from forges has never attained maximum efficiency. The latest order received by the Buffalo Forge Company for a down draft forge outfit goes to Germany. It includes twelve Buffalo Down Draft Forges known as the OD pattern, two of the steel plate O8T, and there are six others likewise outfitted with down draft. The contract also calls for a Buffalo 80-inch steel plate exhaust fan for removing the smoke, No. 8 "B" Blower for furnishing blast—in fact, the complete equipment.

The first of a series of small books to contain concise data on the science of heating and ventilation has been published by the author, William J. Baldwin, the expert in heating and ventilation. The object of the book is stated to be "to provide ready and approximate preliminary data for the architect or engineer who desires to find the first things necessary for the installation of a steam-heating or hot-water apparatus." Such rules are given as are ordinarily required by an architect for designing a building so as to provide space for boilers, find the horse-power, obtain the grate area, approximate the coal requirement, find the height and size of chimney, etc., etc., and these rules are put in concise form for the purpose of ready reference. Paragraphs are given on the following subjects: Condensation, Conditions for a School, Quantity of Air Required, Temperature of Air at Register, Air Units, British Heat Units, Heat Units in One Pound of Steam, Horse-Power, Coal, Grate, Chimney, etc. The rules given are simply stated and readily to be understood and remembered. The book is substantially bound, and is sold at 50 cents. It is published by the author at 108 Beekman street, New York.

The Powers Regulator Company are installing their system of heat regulation in the new Post Office Building at Washington, D. C., and have the contract for automatic heat regulation in the new New York Life Building at Chicago.